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Comments welcome.
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Abstract

This study provides evidence that abnormal returns around bad news management earnings forecasts and abnormal returns during subsequent periods are negatively correlated. Most of the stock price reaction to bad news management forecasts of annual earnings is reversed in the 60 days following the forecast. A significant amount of the cumulative abnormal returns around bad news forecasts of quarterly earnings is reversed in the market's reaction to the following quarterly earnings announcement. This evidence suggests that the market overreacts to the management bad news earnings forecast. Unlike some of the previous overreaction evidence, this study is not subject to the criticisms of beta shifts, cross-firm comparisons, or lengthy intertemporal comparisons. In addition, the results are robust to including many additional variables that could be hypothesized to affect the observed results.

Evidence Regarding the Stock Market's Overreaction to Management Earnings Forecasts

I Introduction

Recently there have been numerous issues raised regarding the adequacy of the Efficient Market Hypothesis (hereafter, EMH) as a valid description of the financial market pricing process for equity securities. These issues have included evidence of overreaction to earnings information (De Bondt and Thaler [1987]; Zarowin [1989; 1990]), evidence of underreaction to earnings information (Bernard and Thomas [1989; 1990]; Foster, Olsen, and Shevlin [1984]; Freeman and Tse [1989]; Mendenhall [1991]), evidence of the P/E effect (Basu [1977]; Fairfield and Harris [1990]; Latane, Tuttle, and Jones [1969]), evidence of the size effect (Cook and Rozeff [1984]), evidence of the January effect (Keim [1983]; Tinic and West [1984]), evidence of the usefulness of fundamental analysis (Holthausen and Larcker [1991]; Ou and Penman [1989a; 1989b]; Stober [1991]), as well as evidence of empirical regularities in stock prices (Chari, Jagannathan, and Ofer [1988]; Chopra, Lakonishok, and Ritter [1992]; De Bondt and Thaler [1985]; Jegadeesh [1991]; Fama and French [1988]; Poterba and Summers [1988]). Until recently, this evidence on the empirical invalidity of the EMH was dismissed by many academics. However, given the proliferation of evidence challenging market efficiency, many financial theorists and empirical researchers now accept that the EMH may be somewhat flawed.

This study adds to the body of knowledge regarding the adequacy of the EMH by analyzing the extent to which the market overreacts or underreacts to management earnings forecasts. If the market reacts efficiently to management forecasts, there should be no systematic pattern in the returns after the management forecast event. However, a positive relation between the abnormal returns surrounding the management earnings forecast and

subsequent abnormal returns would indicate an underreaction by the market to the forecast issuance (a post-forecast announcement drift). The observation of a negative relation between the abnormal returns surrounding the management forecast and subsequent abnormal returns would indicate an overreaction.

This study uses management earnings forecasts to investigate whether the market efficiently responds to public information by examining the relation between abnormal returns at the time of the forecast and later abnormal returns.[1] In this study, OLS regression models, similar to those employed by Chopra, Lakonishok, and Ritter [1992], are used to test the relations between price reactions around the management earnings forecast and price reactions in later periods. The subsequent return periods include 10, 30, and 60 trading days after the forecast issuance as well as the subsequent earnings announcement.[2]

Our results indicate four things. (1) No statistically significant price reversal or drift is observed for good news annual earnings forecast firms. (2) There is a significant price reversal observed after the bad news annual earnings forecasts. This observation is robust to the length of the subsequent window employed (i.e., 10 day, 30 day, or 60 day window). However, the price reversal is concentrated in the period between the forecast and the earnings announcement since the price reaction for the later earnings announcement is not correlated with the price reaction around the prior forecast. (3) A statistically significant negative relation is observed between the price reaction around bad news forecasts of quarterly earnings and the price reactions around subsequent quarterly earnings announcements.[3] (4) Based on the observed price reversals, it is plausible that one could have earned economically substantial excess returns

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[1] Accordingly, this study is not intended to test an investment strategy rule although there are direct implications of our evidence for developing profitable trading strategies. Instead, we intend to provide evidence regarding the extent to which the market reacts inefficiently to management forecasts.

[2] In instances in which the subsequent earnings announcement occurs before the end of the 10, 30, or 60 day window, we constrain the return to be that occurring up to the earnings announcement.

[3] We do not study the association between the forecast announcement abnormal returns and those of subsequent periods (i.e., 10, 30, or 60 day periods) since the quarterly forecasts tend to be issued close to the quarterly earnings announcement.

by buying the stock of extreme "losers" (bad news forecast firms) after the management forecast has been issued. Overall, the evidence suggests that the market overreacts to bad news earnings forecasts by management.

The next section discusses inefficiencies in the market's reaction to earnings announcements and similar information events. In section three, we describe our research design, data and variables. The results of the analyses based on forecasts of annual earnings are provided in section four. Section five contains the results of the analyses conducted on quarterly forecasts. The final section provides implications and the conclusion of this study.

II Market Inefficiency Characterized by Over/Under Reactions to Earnings Information

Ball and Brown [1968] document that, subsequent to the announcement of earnings, CAR's continue to drift up for "good news" firms and down for "bad news" firms.[4] Bernard and Thomas [1989] seek to discriminate between two alternative explanations for post-earnings-announcement drift: a failure to adjust abnormal returns fully for risk, and a delay in the response to the earnings report. They conclude that much of their evidence cannot plausibly be reconciled with arguments built on risk measurement but their evidence is consistent with a delayed price response. In particular, a significant amount of the post-announcement drift occurs on the date of the subsequent earnings announcement.

Recently, another line of research documents the phenomenon of "overreaction". De Bondt and Thaler [1985; 1987] show that firms with prior extreme negative stock price performance, or the "losers", outperform the market in the later periods. Likewise, firms with prior extreme positive stock price performance, "winners", underperform the market in the later

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[4] This phenomenon is also documented in at least 20 other studies.

periods. De Bondt and Thaler [1987] hypothesize that the reason for this phenomenon is the market's inefficient response (overreaction) to earnings information.

Whether the De Bondt and Thaler evidence should be interpreted as evidence of overreaction to earnings announcements is still a subject of debate. First, Bernard [1992] points out that the overreaction, as studied by De Bondt and Thaler, cannot be characterized as an overreaction to earnings, per se. A predictable reversal of prior period extreme price movement is consistent with a variety of market inefficiencies--including random deviations of price from fundamental values--and need not be caused by any systematic misinterpretation of earnings information. Second, the "losers" and "winners" are different firms, and stock returns are compared across periods that may be significantly different. Consequently, differential firm characteristics (e.g., firm size) as well as confounding time effects (e.g., risk changes) may be driving the documented effect.

Zarowin [1989; 1990], controlling for the size effect, tests the overreaction hypothesis. As noted by De Bondt and Thaler [1987], the losers are normally small firms. Zarowin matches losers with winners of equal size and finds little evidence of differential performance. This result suggests that the superior performance of losers relative to winners is not due to investor overreaction, but instead is a manifestation of the size effect since the losers tend to be small firms while the winners are large.

Chan [1988], and Ball and Kothari [1989] argue that the empirical evidence of return reversals can largely be attributed to uncontrolled risk changes. Since the equity beta of a firm is a function of both the firm's asset risk and its capital structure, the loser's (winner's) equity beta will increase (decrease) due to a series of negative (positive) abnormal returns. Consequently, the losers will have higher betas and, therefore, higher expected returns than the winners. The evidence provided by Ball and Kothari [1989] shows that the betas of losers are much higher (a difference of .76 in an extreme case) than those of winners following the

portfolio formation period. They contend that the large beta difference is likely to account for substantial differences in realized returns.

The above arguments suggest that the inferences in the overreaction studies may be more problematic than those found in underreaction studies. Chopra, Lakonishok, and Ritter [1992] argue that the methodologies employed by Zarowin and by Ball and Kothari are biased toward attributing differential returns to size and beta adjustments. They find that De Bondt and Thaler's results remain significant even after adjusting for size and risk effects. Chopra, Lakonishok, and Ritter attempt to reconcile the stock return overreaction evidence with the earnings announcement underreaction evidence. They show that part (about 20 percent) of the superior performance of losers over winners is concentrated within the three day intervals surrounding earnings announcements in the later periods. Moreover, their results are robust to both the size effect and risk change arguments. Their evidence is consistent with the De Bondt and Thaler conjecture of an overreaction to earnings announcements.

The existence of both overreaction and underreaction phenomena in financial markets that have been considered efficient is difficult to reconcile. Bernard [1991] offers four possible explanations to resolve this controversy. (1) The overreaction cannot be characterized as an overreaction to earnings per se as described above. (2) Both underreactions to earnings and overreactions to earnings occur. Specifically, stock prices could underreact, on average, to earnings, while overreactions occur only under conditions too complex to be captured by a simple partition on prior periods earnings changes. (3) The market's response to earnings announcements defies a simple characterization as underreaction or overreaction. (4) Research design flaws cause the observed "underreaction" and "overreaction" phenomena.

Nevertheless, if the market efficiently reflects the public information contained in an announcement, the stock price movement in the subsequent period should not be a systematic function of the previous price reactions (e.g., around prior management forecasts). This study

intends to investigate the overreaction and underreaction phenomena using the management earnings forecast event.[5]

Previous research regarding the overreaction and underreaction phenomena has been criticized on methodological grounds. The use of management forecasts to study this topic has three prominent advantages over informative events studied in previous research. (1) The subsequent issuance of earnings announcements is the realization of the prior information. Consequently, this study provides direct tests of both the underreaction and the overreaction hypotheses. (2) The forecast and subsequent earnings announcements are issued within one year or less for the annual earnings forecasts and within a few days for the quarterly earnings forecasts. Therefore, risk changes should be minimal over such a short period. Accordingly, the risk change argument for observing a reaction is not valid. (3) The research design focuses on the price reactions for the same firm across different periods. Consequently, the size effect will not be problematic.[6]

III Research Design, Data, and Variables

This section describes the research design, data sources, and variables used to conduct our analyses. The underlying motive for these tests is to determine whether the stock market efficiently responds to the information in management annual and quarterly earnings forecasts. If the market underreacts, a positive correlation between the abnormal returns around the management forecast (CARM) and the abnormal returns during later periods (including the subsequent earnings announcement) is expected. On the other hand, if the market overreacts, a negative correlation between the abnormal returns around the management forecast and the abnormal returns during the following periods is expected to be observed.

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[5] This study examines both management forecasts of annual earnings and management forecasts of quarterly earnings.

[6] In addition, many other information environment factors are controlled since the firms issuing forecasts are generally large NYSE or AMEX firms (e.g. Cox [1985]).

In this study, the four-day (days -2 to +1) cumulative (or average) abnormal return is used to measure the price reaction to the management forecast.[7] The subsequent periods employed include the next 10 trading days (days +2 to +11), the subsequent 30 trading days (days +2 to +31), and the subsequent 60 trading days (days +2 to +61) after the management forecast event periods (but before the subsequent earnings announcement).[8] In addition, the four-day cumulative abnormal return around the following earnings announcement (CARE) is also employed.

The analysis is conducted using a regression approach similar to the approach employed by Chopra, Lakonishok, and Ritter [1992]. We run analyses using both average abnormal returns (AVAR) and cumulative abnormal returns (CAR). The basic regression analyses are as follows:

$$AVAR(t)_i = \gamma_0 + \gamma_1 AVARM_i + \epsilon \quad (1)$$

$$CARE_i = \gamma_0 + \gamma_1 CARM_i + \epsilon \quad (2)$$

where: γ_0 and γ_1: OLS regression coefficients;

$AVAR(t)_i$: the average abnormal return during the subsequent t trading day return after the management forecast for firm i;

$AVARM_i$: the average four-day abnormal return around the management forecast for firm i;

$CARM_i$: the cumulative abnormal return around the management forecast for firm i;

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[7] We choose to include the day after the forecast issuance (day +1) in the event that our forecast date is imprecise since discrepancies exist between the Wall Street Journal Index and Dow Jones News Retrieval regarding the date of the forecast issuance. A priori, there is no reason to expect that the inclusion of day +1 would bias our results.

[8] All the sample firms have at least 10 daily return data in the subsequent period. Firms which have less than 20 (45) daily return data due to the overlap with the subsequent earnings announcement event period are excluded from the 30 (60) day regression analyses.

$CARE_i$: the cumulative abnormal return around the earnings announcement for firm i;

ϵ: the regression error term.

To avoid difficulties in modeling the expectations of the market regarding the forecasted earnings and determining whether the forecast is good or bad news, we classify firms that have positive (negative) abnormal returns (CARM) for the management forecast event as good news (bad news) firms or the winners (losers).[9] Based on the regression results, we examine the returns for a trading strategy that buys securities immediately after the management forecast event period and holds them for 60 days (days +2 to +61), or until the following earnings announcement date, whichever one is shorter. This allows us to determine whether there is differential performance for the following five portfolios of firms: (1) the complete sample of firms; (2) the winners (firms experiencing positive returns for the management forecast event); (3) the losers (firms experiencing negative returns for the management forecast event); (4) the extreme winners (CARM greater than .05); and (5) the extreme losers (CARM less than -.05).

The abnormal returns are estimated using a market model approach.[10] Each firm's market model estimation period consists of 400 observations. They are the 200 consecutive daily observations preceding the start of the management forecast event window (days M-202 to M-3, where M is the day of the management forecast) and the 200 consecutive daily observations beginning two days after the actual earnings announcement after the forecast (days E+2 to E+201, where E is the day of the earnings announcement). In instances in which there are not

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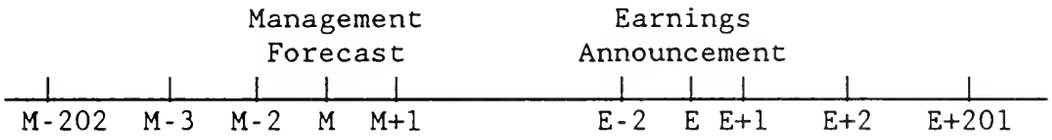
[9] We examine the sensitivity of our results based on quarterly forecasts to this method of identifying good and bad news firms by using the difference between the management forecast and the previous median analyst forecast. Our results are very similar.

[10] We have examined the sensitivity of some of our results to using excess returns (from the CRSP excess returns tape) rather than abnormal returns from a market model approach. Our results and inferences are robust across both measures. In addition, we examined the sensitivity of our results to using market model parameters estimated using the 200 days prior to the management forecast, the 200 days subsequent to the earnings announcement, and both periods. The results are insensitive to the choice among these three estimation periods. This suggests that beta shifts are not driving our results.

400 observations available, the estimation is based on at least 200 observations during the period defined above.

In the following diagram, the intervals [M-202, M-3] and [E+2, E+201] represent the estimation period, and the intervals [M-2, M+1] and [E-2, E+1] represent the four day event windows for the management forecast and the earnings announcement events, respectively.



The sample of firms that have a management forecast of earnings is the same sample employed by Yeo [1990]. The sample was collected using the Dow Jones News Retrieval Service and consists of management forecasts issued during the January, 1981 to December, 1987 period. The following sample selection criteria were employed:

1. The firms must be included on the Compustat Annual Industrial and CRSP Daily Return files. Compustat industry codes are between 0100 and 3999 or between 5000 and 5999.

2. A point forecast of earnings per share must be provided in the management forecast or can be readily estimated from the disclosure.

3. The management forecast must be attributed to a company official.

4. The management forecast must be disclosed at least one month before the actual earnings announcement date.

In addition, firms must have at least 200 daily returns during the estimation period defined above; firms with less than 200 are not included in the sample. The resulting final sample, on which we conduct our analyses, contains 180 forecast instances. This sample includes 87 firms that we define as bad news firms (losers) since they have a negative CARM in response to the management forecast. The remaining 93 firms are defined as good news firms (the winners) since there is a positive price response to the management forecast. The subsequent earnings

announcement date is collected from either the Compustat Quarterly file or the Wall Street Journal Index.

The regression analyses in this section, equations (1) and (2), are employed to test the following two hypotheses (presented in null form):

> H_1: There is no relation between the abnormal return around the management forecast and the abnormal return in the subsequent period prior to the next earnings announcement.
>
> H_2: There is no relation between the cumulative abnormal return around the management forecast and the cumulative abnormal return for the following earnings announcement.

A positive estimate for γ_1 in equation (1) or (2) suggests that the market underreacts to the information in the management forecasts since the abnormal returns continue to drift upward (downward) for the good news (bad news) firms. The observation of a negative estimate for γ_1 in equation (1) or (2) indicates that the market overreacts to the information in the management forecasts since the abnormal returns drift downward (upward) for the good news (bad news) firms. We also will consider the stock performance in the subsequent period and test the following hypothesis:

> H_3: The stock performance (abnormal returns) of good news (winners) and bad news (losers) subsequent to the issuance of management forecasts is equal to zero.

The test of this hypothesis is used to further assess the economic impact of the overreaction or underreaction phenomena.

IV Results Based on Forecasts of Annual Earnings

The results of our empirical analyses, based on management's forecasts of annual earnings, are described in this section. Table 1 presents the descriptive statistics for the variables and the correlation among the variables for the bad news and good news forecast

firms, respectively.[11] For the good news forecast firms (Panel B), no significant correlation is observed between the market reaction at the management forecast (CARM) and any of the subsequent period returns (AVAR(10), AVAR(30), AVAR(60), and CARE). This suggests there is neither an underreaction nor an overreaction to the good news management forecasts of annual earnings.

Insert Table 1

For the bad news forecast firms, there is evidence of a relation between the reaction at the time of the management forecast and later returns. Although there is not a statistically significant relation between the market reaction to the management forecast (CARM) and the market reaction to the following earnings announcement (CARE) for the bad news firms, there is a statistically significant negative relation between the market reaction to the management forecast (CARM) and the abnormal returns in the subsequent 10, 30, and 60 trading day periods (AVAR(10), AVAR(30), and AVAR(60)).[12] The correlations between CARM and AVAR(10), AVAR(30), and AVAR(60) are -.260, -.270 and -.365. They are significant at the

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[11] To ensure that the observed abnormal returns are not due to bid/ask effects we provide the following evidence. The mean stock price for all firms is $38.33 with a standard deviation of 22.94. The minimum price is $2.625 with a maximum price of $228.50. Given that the stock prices are not small, one would expect the bid/ask effect to be minimal. The mean stock price for the bad news firms is $36.89 while it is $39.66 for the good news firms. For the extreme bad news firms the mean stock price is $26.76. The mean stock price is $40.35 for the extreme good news firms.

[12] In order to examine whether our results are due to the coefficient estimates for the market models we provide the following information regarding our estimates.

For the 93 good news firms, the mean intercept is .00028 (t-value of 2.60 for testing the null that the intercept is 0.0) and the mean beta is 1.0296 (t-value of 0.75 for testing the null that beta equals 1.00). There are 27 instances in which the absolute value of the intercept is greater than zero by a value of .001 or larger. Beta is greater than 1.50 or less than .50 for 13 of the good news firms' market models.

For the 87 bad news firms, the mean intercept is .00013 (t-value of 1.28 for testing the null that the intercept is 0.0) and the mean beta is .923 (t-value of -1.90 for testing the null that beta equals 1.00). There are 21 instances in which the difference between the absolute value of the intercept and zero is equal to or greater than .001. Beta is greater than 1.50 or less than .50 for 16 of the bad news firms' market models.

When the observations for the bad news firms with extreme values for the intercept or beta are eliminated from the sample, the results obtained are similar although slightly weaker. The results of additional regressions in which the subsequent period abnormal returns (10, 30, and 60 trading day periods) are regressed on the abnormal return at the time of the forecast and the intercept and beta (from the market model) indicate that the abnormal return in the subsequent 60 trading day period is associated with the intercept estimate but not the beta estimate. Although the inclusion of the intercept is statistically significant for the 60 trading day subsequent period, the regression coefficient for the abnormal returns during the forecast event remains statistically significant. These results are available from the authors upon request.

.02 .02, and .01 levels respectively.[13] This evidence suggests that the market inefficiently reacts to the issuance of bad news forecasts yet efficiently reacts to the good news forecasts. The inefficient reaction to the bad news forecasts is manifested in an overreaction.

Figure 1 provides a graph of the abnormal returns for five periods for both the good news and the bad news groups of firms. The patterns suggest that both the good news and the bad news groups reverse the initial reaction to the management forecast.

Insert Figure 1

Figures 2 and 3 provide a graph of the mean abnormal returns similar to those in Figure 1 except the securities are placed in five portfolios based on the magnitude of the abnormal return at the management forecast. For the bad news firms, Figure 2 suggests that it is the two quintiles with the largest reaction to the management forecast that demonstrate the reversal in the subsequent periods. It is only these two quintiles which have a positive abnormal return in the later periods.

Insert Figure 2

In Figure 3, the mean abnormal returns for the five periods are plotted for the good news forecast firms. The results are mixed and indicate that some reversal does occur but that it is not systematic across the alternative windows.

Insert Figure 3

The regression results are provided in Tables 2 and 3. For bad news firms, the results reported in Table 2, Panel A depict a significant relation between the observed reaction to the management forecast (AVARM) and the abnormal returns in the subsequent period. The regression coefficients for the 10 day, 30 day, and 60 day period are -.150, -.082, and -.076, respectively. They are statistically significant at the .05, .05, and .01 levels. The adjusted R^2's

[13] The three Spearman rank-order correlations are -.204, -.138, and -.278, respectively. They are significant at the .05, .20, and .02 levels. Consequently, the statistically significant negative product-moment correlations are not likely to be driven by a few extreme observations.

for the three regression equations are .0567, .0620, and .1217, and the three intercept estimates are not significantly different from zero. The results provided in Table 3, Panel A indicate that the regression coefficient linking the following earnings announcement reaction to the management forecast reaction is .026. It is not statistically different from zero.

Insert Tables 2 and 3

For good news firms, no significant result is observed; this is expected given the correlations reported in Table 1. In Table 2, Panel B, the regression coefficients linking the returns in the following periods to the market reaction for the management forecast are statistically insignificant across all three event windows (10 days, 30 days, and 60 days). In addition, the results in Table 3, Panel B, report an insignificant coefficient between the market reaction at the time of the management forecast and the market reaction at the time of the following earnings announcement.

In summary, these results suggest that the price reactions in the post-forecast periods are negatively correlated with the price reactions to the management forecasts for the bad news forecast firms. This evidence is consistent with the overreaction hypothesis since the reaction to the management forecast is reversed. Although consistent with the market overreacting, this evidence on the reaction to management forecasts is contradictory to the "post-announcement-drift" (underreaction) phenomenon observed for earnings announcements.

We investigate the post-forecast stock performance of various portfolios using abnormal returns computed as previously described. The five portfolios analyzed include (1) all firms in our sample, (2) the bad news firms, (3) the good news firms, (4) extreme good news firms (CARM >.05), and (5) extreme bad news firms (CARM < -.05). The period of analysis consists of the 60 days after the forecast event period or the period between the forecast event and the following earnings announcement, whichever is shorter. These results are presented in

Table 4.[14] In general, the bad (good) news firms have positive (negative) average abnormal returns in the later period.[15] Although both the positive and negative abnormal returns for the bad news and good news portfolios are not significantly different from zero, the results in Table 4 do suggest that the portfolio of extreme bad news firms (losers) are statistically different than zero.[16] The extreme losers experience significant positive abnormal returns during the 60 days after the management forecast. During this 60 day period, the average single day abnormal return for the 24 extreme losers is .00121. This abnormal return is substantial, about 30 percent, annualized. The t-statistic for the average abnormal return is 2.139 and is significant at the .05 level. This result reveals that the overreaction to the management forecast for the extreme bad news management forecasts is not only statistically significant but is also economically significant.[17]

Insert Table 4

V Results Based on Forecasts of Quarterly Earnings

In the previous section, we provide the results of our analysis focusing on management forecasts of annual earnings. In this section, we report the results of our analysis focusing on

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[14] Since the regression results suggest that the price reversal does not happen in the subsequent earnings announcement period, the 60 days subsequent period employed will not include the earnings announcement period.

[15] It should be noted that the overreaction phenomenon is not observed for good news firms using the regression approach for the analysis. Consequently, although we observe a marginally significant reversal for the good new firms, we have no explanation for this result.

[16] We do not pool the standard errors and test whether the excess returns are different across the two portfolios in the subsequent period for good and bad news firms since the pooling of standard errors may be problematic.

[17] In order to determine the extent to which non-normality in the distributions of the abnormal returns for the extreme bad news portfolios affects our inferences, we employ computer intensive resampling techniques to empirically generate sampling distributions for our statistics. From the sample of bad news firms, we chose the 30 firms with the largest negative abnormal returns at the time of the management forecast, we randomly choose 15 firms and compute the cumulative abnormal return for the 10 day, 30 day, 60 day, and subsequent earnings announcement period. This was repeated for 10000 trials. For the 10 day period, the mean cumulative abnormal return is between .02 and .025 with 91.4% of the distribution being greater than zero. The mean cumulative abnormal return for the 30 day window is also between .02 and .025 with 79.6% of the distribution being greater than zero. The 60 day period has a mean cumulative abnormal return of between .055 and .06 with 93.8% of the distribution greater than zero.

management forecasts of quarterly earnings. We extend our analysis to quarterly earnings forecasts to determine the extent to which the results are similar to those for annual earnings forecasts. Since the length of time between the forecast issuance and the earnings announcement is short, we expect fewer extraneous information events to have occurred in the interim and this allows us to analyze the extent to which the reaction to the forecast is reversed in the reaction to the earnings announcement. Given our results for annual earnings forecasts, we focus on the overreaction of the market to bad news management forecasts.[18]

Since the period between quarterly forecasts and following earnings announcements is very short, we only employ two periods for our analyses. They are (1) a four day event window surrounding the subsequent quarterly earnings announcement, and (2) the period between the forecast event window and the quarterly earnings announcement event window. The number of days included in the second period of analysis varies since the number of days between the forecast and the earnings announcement differs significantly across firms. The mean and median number of trading days between the quarterly earnings forecast by management and the following earning announcement in our sample is 18.83 and 14, respectively.

The sample of management forecasts of quarterly earnings is from Liu [1992]. The sample contains 78 bad news forecasts for the period between October 1983 and December 1986. The sample selection criteria are the same as those used for the annual earnings forecasts except for the first and fifth criteria. We relax the criteria regarding the industries included and do not require the forecast to be issued more than a month before the following earnings announcement. Quarterly forecasts for the fourth quarter are not included in the analysis to avoid any confounding effects with annual forecasts. An analysis of potential confounding events listed in the Wall Street Journal Index during the period between the management forecast and the earnings announcement indicates that 42 out of the 78 had no events listed while 21 had one

[18] Consistent with the results for good news annual earnings forecasts, we tested good news forecasts of quarterly earnings and observed statistically insignificant price reversals.

event.[19] Each news event was analyzed to determine if any event would be expected to significantly impact the market or to systematically impact our results.[20]

The two basic regression models employed for this analysis are described below.

$$AVARFE_i = \gamma_0 + \gamma_1 AVARM_i + \epsilon \quad (3)$$

$$CARE_i = \gamma_0 + \gamma_1 CARM_i + \epsilon \quad (4)$$

where: $AVARFE_i$: average daily abnormal return in the period between the forecast event period and the earnings announcement event for firm i;

γ_0 and γ_1: OLS regression coefficients;

The other variables are as described previously.

Equation (3) is the same as equation (1) used in the annual earnings forecast analysis except that the subsequent window is defined differently. Equation (4) is the same as equation (2) described previously.

Descriptive statistics and product-moment correlations for the variables are presented in Table 5.[21] In addition, the ex-post forecast error, included in the analysis (equation (5) which is discussed later) to control for the surprise in the earnings announcement is also provided. The abnormal returns surrounding the management forecast, CARM, and the average daily abnormal return during the period between the management forecast and the quarterly earnings announcement, AVFE, are not significantly correlated. This contrasts with the results based on annual earnings forecasts reported above. However, the correlation between abnormal returns surrounding the management forecast, CARM, and abnormal returns surrounding the quarterly

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[19] The remaining 15 had the following numbers of news events during the period between the management forecast and the earnings announcement: 2 news events - 6 firms; 3 news events - 3 firms; 4 news events - 1 firm; 5 news events - 1 firm; 6 news events - 3 firms; and 1 firm had 23 news events.

[20] A listing of our sample firms (for the quarterly forecasts) and the news events between the management forecast and the earnings announcement is available from the authors upon request.

[21] The mean stock price is $31.59 with a standard deviation of 16.24. The minimum stock price is $3.625 while the maximum is $102.75. Stock prices at these levels suggest that our results are not being driven by the bid/ask spread effect.

earnings announcement, CARE, is -.267 and is statistically significant at the .02 level.[22] This significant correlation, although different from that observed for the annual earnings analysis, supports the overreaction hypothesis.

Insert Table 5

A plausible explanation for the difference in results between the annual earnings forecasts and the quarterly earnings forecasts exists. For the firms in our sample, the mean number of trading days between the issuance of the annual earnings forecast and the actual annual earnings announcement is 129, while the median is 123 trading days. Since annual forecasts are issued many days before the earnings announcements, other information sources may have already been incorporated in the security prices prior to the earnings announcements. Consequently, the overreaction cannot be observed in the earnings announcement event period. However, since the quarterly earnings forecasts and the quarterly earnings announcements are closely issued, the extraneous information may be limited or the market may choose to wait until the earnings information becomes certain before correcting the overreaction. Therefore, the correction is observed at the time of the quarterly earnings announcement.

Table 5 also shows that the correlation between abnormal returns surrounding the quarterly earnings announcement, CARE, and the surprise in the quarterly earnings announcement, FE, is .229. As expected, this association is positive and is significant at the .05 level. This result suggests that the observed price reactions around the following quarterly earnings announcement is a function of both the unexpected earnings and the correction of the previous overreaction. The correlation between the abnormal returns surrounding the quarterly earnings forecast, CARM, and the surprise in the quarterly earnings announcement, FE, will be discussed later.

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[22] The Spearman rank-order correlation is -.241 and is significant at the .04 level.

The regression results for the two regression analyses (equations (3) and (4)) using quarterly earnings forecasts by management are presented in Tables 6 and 7. In Table 6, the reported coefficient estimate for equation (3), linking the average daily abnormal return during the period between the management forecast and the following quarterly earnings announcement (AVFE) to the average daily abnormal return surrounding the quarterly earnings forecast (AVARM), is positive and insignificant. However, the coefficient estimate for equation (4), reported in Table 7, which links the abnormal returns around the quarterly earnings announcement to the abnormal returns around the management forecast is -.24. This coefficient estimate is statistically significant at the .05 level. The adjusted R^2 for equation (4) is .0588. This evidence is consistent with the overreaction hypothesis and is contradictory to the underreaction hypothesis.[23] The noteworthy difference between the results for annual and quarterly forecasts is that the price reversal of the overreaction is observed in different periods.

Insert Tables 6 and 7

We control for the unexpected earnings in the quarterly earnings announcement since the observed price reaction around the earnings announcements should be a function of the surprise component of the earnings announcement (unexpected earnings). In addition, it is desirable to control for the unexpected earnings since one could contend that the observed price reversal is due to good news in the quarterly announcement. The next regression analysis incorporates the ex-post forecast error to control for the unexpected earnings.[24] The model is as follows:

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[23] Similar to the results using annual forecasts, no significant result is found for goods news forecasts of quarterly earnings.

[24] Since the quarterly earnings forecasts and earnings announcements are issued within a relatively short period of time, we use the forecast error, the difference between the actual quarterly earnings and that forecasted by management, to proxy for the unexpected earnings.

$$CARE_i = \gamma_0 + \gamma_1 CARM_i + \gamma_2 FE_i + \epsilon \quad (5)$$

where: FE_i: difference between actual quarterly EPS and the forecasted quarterly EPS deflated by the pre-forecast stock price.

The other variables are as previously defined.

Since McNichols [1989] has documented a positive correlation between the abnormal return surrounding the management forecast, CARM, and the ex-post forecast error (FE), the above regression model may suffer a multicollinearity problem. We do not believe this to be problematic since the simple correlation between FE and CARM is only .193.

The results of our analysis using equation (5) are presented in Table 8. The coefficient estimates for CARM and FE are -.29 and 1.22, respectively. They are both statistically significant at the .01 level and the adjusted R^2 is .1303. After controlling for the unexpected earnings, the regression coefficient for CARM is more significant and the evidence supporting the overreaction phenomenon is more prominent.

Insert Table 8

The price reactions around the following quarterly earnings announcements are also significantly correlated with the forecast error. This result suggests our use of the management forecast error to proxy for the surprise in the quarterly earnings announcement is appropriate. Consequently, the observed negative correlation between CARM and CARE is not likely to be due to the surprise in the earnings announcement, proxied by FE.[25]

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[25] We also include the following variables in additional analyses to determine if they are driving the observed results: (1) beta; (2) firm size; (3) the number of analysts following the firm; and (4) the forecast dispersion (standard deviation of previous analysts forecasts). The regression coefficients for all these variables are not statistically significant and our results are robust to the inclusion of these additional variables. For an additional analysis of the robustness of our results, we employ an alternative definition of a bad news forecasts. Instead of using the observed market reaction to the management forecast to stratify the firms into good and bad news forecasts, we define bad news forecast firms as those with a management forecast of quarterly EPS less than previous median of the analysts' forecasts of quarterly EPS. The sample of bad news forecast firms identified using this approach is very similar to the sample on which we base our results reported above; the results are basically the same and the inferences remain unchanged. These results are not reported but can be obtained from the authors upon request.

In this section, we consider the security performance in the period between two days after the quarterly earnings forecast by management and the day before the quarterly earnings announcement. The results are presented in Table 9.

Insert Table 9

Contrary to the results reported for the annual forecasts, we do not find a positive average abnormal return for the bad news firms throughout this period. Instead, we observe a negative average daily return for the sample of bad news firms. However, the extreme losers do appear to have positive abnormal returns; although they are not statistically significant.

VI Implications and Conclusion

This study considers the relation between price reactions around management earnings forecasts and price reactions in subsequent periods, including the following earnings announcement. The Efficient Market Hypothesis predicts that one should not observe a significant association between the abnormal returns around the forecast and abnormal returns in the following periods (including the earnings announcement periods). However, this study provides evidence that the abnormal returns around management bad news earnings forecasts and the abnormal returns in subsequent periods are negatively correlated. This evidence is consistent with the market overreacting to the management forecasts. More importantly, since firms issuing forecasts and earnings announcements are the same firms, and ex-post forecast errors are controlled, the evidence based on the quarterly forecasts clearly indicates that the market overreacts to the management bad news earnings forecast. However, no statistically significant price reversal is found for good news management earnings forecasts.

Previous studies (e.g., Waymire [1984] and McNichols [1989]) document that, for both good and bad news forecasts, the specific information about the firm's future earnings is what drives the price reaction to management forecasts. According to Ajinkya and Gift [1984], managers have incentives to disclose bad news forecasts to avoid dramatic swings in stock price

at the end of the period when actual earnings are announced.[26] Thus, bad news forecasts could be used as means of "inoculating" the market for the forthcoming bad news in the earnings. Yeo [1990] finds some evidence to support the inoculation hypothesis. However, investors may speculate that the real information that the managers have received (and not reported) is even worse than the information revealed through the management earnings forecasts. Therefore, the market could be overly pessimistic about the bad news management earnings forecast, and that results in the overreaction.

Although both overreaction and underreaction phenomena have been documented in the literature, the two phenomena are clearly contradictory to each another and to the Efficient Market Hypothesis. However, previous overreaction studies are vulnerable to the different firm characteristics (e.g., the size effect) and comparisons across different periods (e.g., the risk change) arguments. On the other hand, this study does not suffer from these methodological difficulties. The evidence in this study unambiguously indicates that the market overreacts to the bad news management earnings forecasts and we find no evidence of the "post-announcements-drift" phenomenon.

The results of this study also demonstrate that the quarterly forecast errors are correlated not only with price reactions around the management forecast (McNichols [1989]) but also with the price movements in the following earnings announcement period. This result combined with the overreaction evidence shows that the market may only possess limited information regarding ex-post forecast errors and is overly pessimistic in general about the bad news management earnings forecast in the prior forecast event period.

The evidence in this study is clearly an anomaly to the Efficient Market Hypothesis. Future studies should concentrate on investigating other information issues and providing explanations for the overreaction phenomenon documented in this study.

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[26] Other incentives to release a forecast include: (1) signaling a manager's ability (Trueman [1986]); (2) reducing the unequal access to private information enjoyed by a subset of the stockholders (Lees [1981]); and (3) preventing the firm from being erroneously perceived as a bad firm (Verrecchia [1983] and Dye [1985]).

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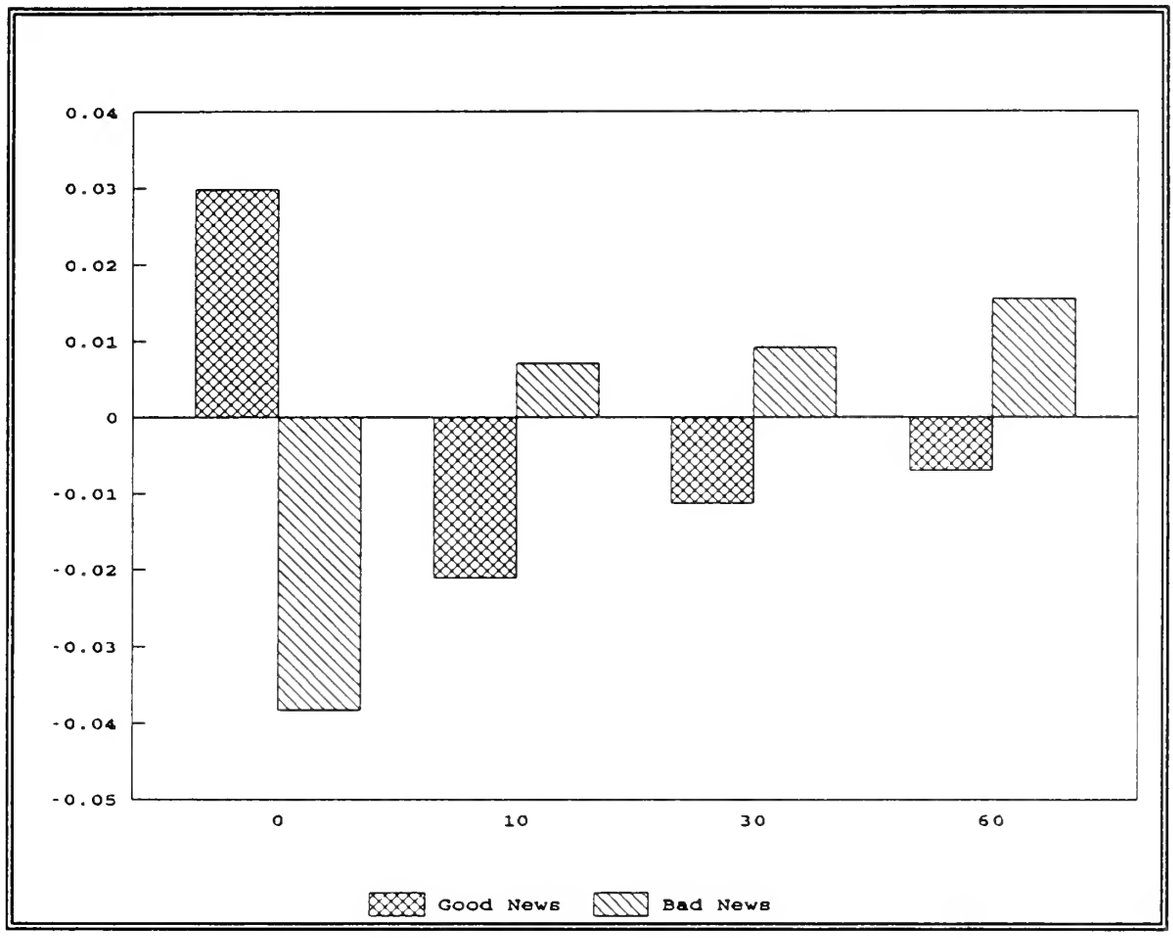
Figure 1 - Plot of Cumulative Abnormal Returns for Management Forecasts - Good News and Bad News Groups



0 = cumulative abnormal return during the -2 to +1 forecast event period

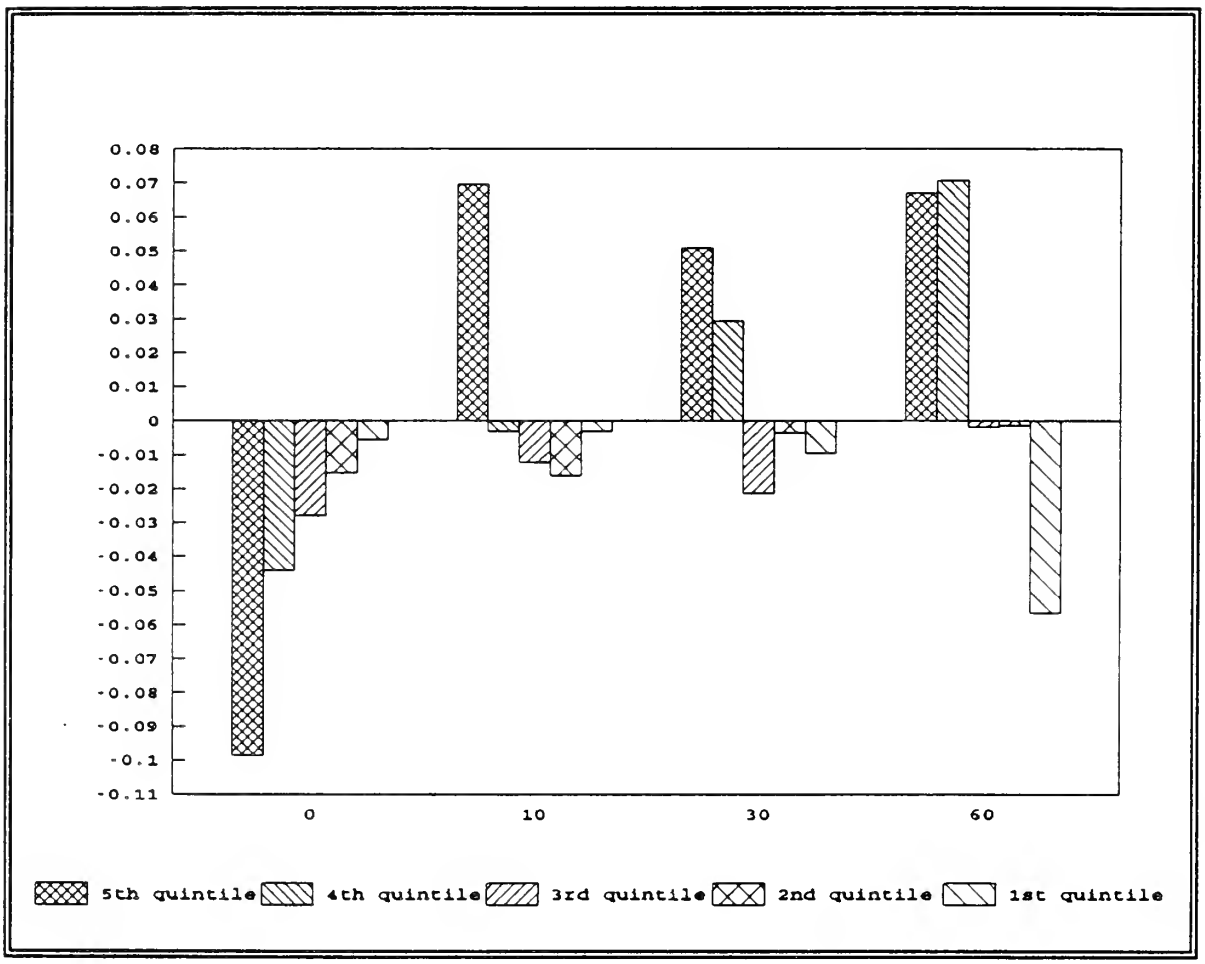
10 = cumulative abnormal return - 10 trading days subsequent to the forecast event period (days +2 to +11)

30 = cumulative abnormal return - 30 trading days subsequent to the forecast event period (days +2 to +31)

60 = cumulative abnormal return - 60 trading days subsequent to the forecast event period (days +2 to +61)

Figure 2 - Plot of Cumulative Abnormal Returns for Bad News Management Forecasts - Quintiles

Firms Stratified into Quintiles Based on the Magnitude of the Abnormal Return for the Management Forecast



0 = cumulative abnormal return during the -2 to +1 forecast event period

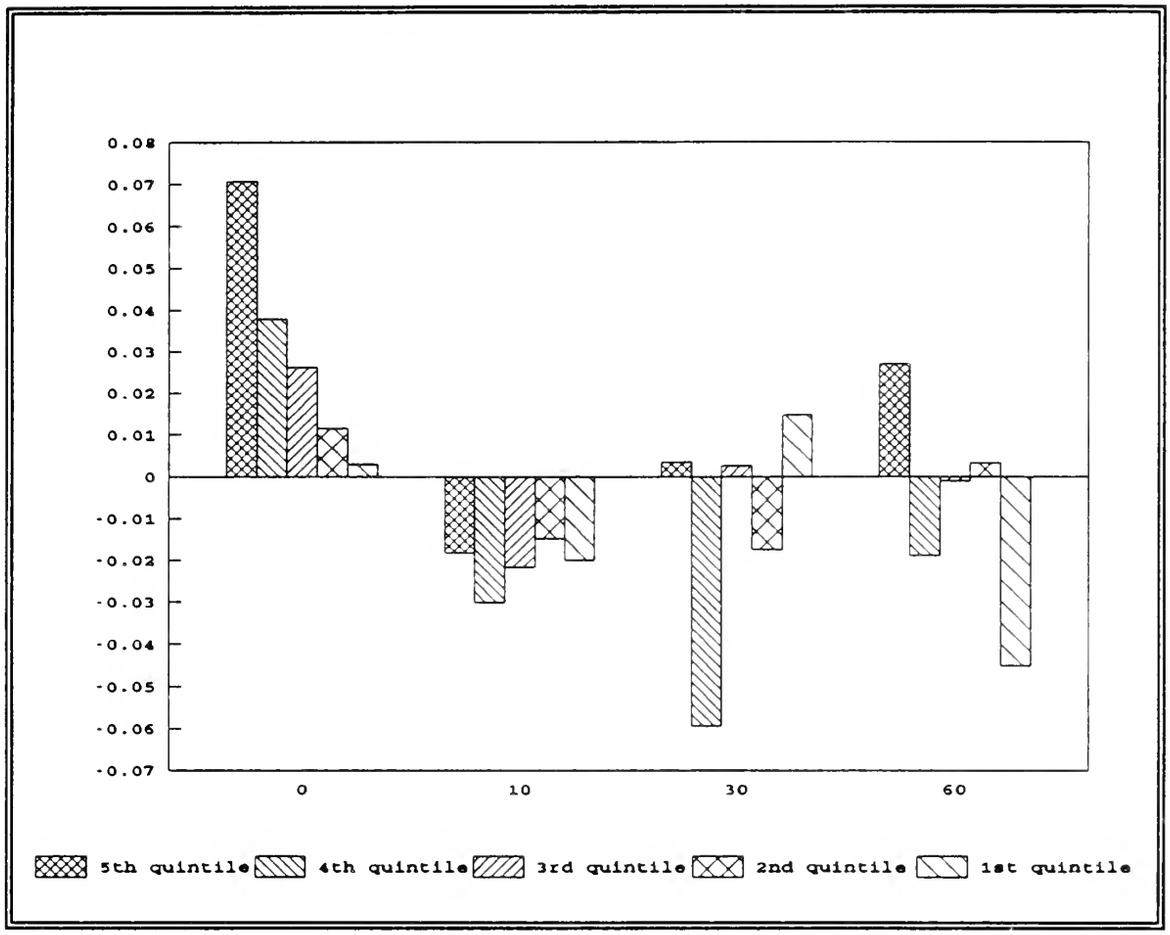
10 = cumulative abnormal return - 10 trading days subsequent to the forecast event period (days +2 to +11)

30 = cumulative abnormal return - 30 trading days subsequent to the forecast event period (days +2 to +31)

60 = cumulative abnormal return - 60 trading days subsequent to the forecast event period (days +2 to +61)

Figure 3 - Plot of Cumulative Abnormal Returns for Good News Management Forecasts - Quintiles

Firms Stratified into Quintiles Based on the Magnitude of the Abnormal Return for the Management Forecast



0 = cumulative abnormal return during the -2 to +1 forecast event period

10 = cumulative abnormal return - 10 trading days subsequent to the forecast event period (days +2 to +11)

30 = cumulative abnormal return - 30 trading days subsequent to the forecast event period (days +2 to +31)

60 = cumulative abnormal return - 60 trading days subsequent to the forecast event period (days +2 to +61)

Table 1

Descriptive Statistics - Annual Earnings Forecasts
Bad News Firms (Panel A) and Good News Firms (Panel B)*

Panel A - Bad News Firms (sample size = 87; except for AVCAR-60 = 77)

Variable	Mean	Standard Deviation
CARM (Cumulative 4-Day Abnormal Return - Management Forecast)	-.04066	.04305
AVAR-10 (Average Daily Abnormal Return for Subsequent 10 days)	.00048	.00619
AVAR-30 (Average Daily Abnormal Return for Subsequent 30 days)	.00002	.00328
AVAR-60 (Average Daily Abnormal Return for Subsequent 60 days)	.00034	.00227
CARE (Cumulative 4-Day Abnormal Return - Earnings Announcement)	-.00123	.04365

Pearson Product Moment Correlations (Significance Level)

	CARM	AVCAR-10	AVAR-30	AVAR-60	CARE
CARM	1.00	-.26 (.02)	-.27 (.02)	-.37 (.01)	.03 (.82)
AVAR-10		1.00	.60 (.01)	.37 (.01)	-.07 (.52)
AVAR-30			1.00	.66 (.01)	-.14 (.21)
AVAR-60				1.00	.11 (.35)
CARE					1.00

* Good news and bad news firms are identified by the sign of the abnormal return at the time of the management earnings forecast.

Table 1 - Continued

Descriptive Statistics - Annual Earnings Forecasts
Bad News Firms (Panel A) and Good News Firms (Panel B)

Panel B - Good News Firms (sample size = 93; except for AVCAR-30 = 91 and AVCAR-60 = 71)

	Variable	Mean	Standard Deviation	
	CARM (Cumulative 4-Day Abnormal Return - Management Forecast)	.03082	.02423	
	AVAR-10 (Average Daily Abnormal Return for Subsequent 10 days)	-.00167	.00535	
	AVAR-30 (Average Daily Abnormal Return for Subsequent 30 days)	-.00078	.00307	
	AVAR-60 (Average Daily Abnormal Return for Subsequent 60 days)	-.00043	.00223	
	CARE (Cumulative 4-Day Abnormal Return - Earnings Announcement)	.00247	.05259	

Pearson Product Moment Correlations (Significance Level)

	CARM	AVAR-10	AVAR-30	AVAR-60	CARE
CARM	1.00	.02 (.85)	.03 (.78)	.13 (.29)	.12 (.26)
AVAR-10		1.00	.54 (.01)	.39 (.01)	.13 (.22)
AVAR-30			1.00	.72 (.01)	.18 (.09)
AVAR-60				1.00	.13 (.28)
CARE					1.00

Table 2

Regression Results - Annual Earnings Forecasts

Abnormal Returns Subsequent to the Management Forecast Regressed on the Abnormal Returns for the Management Forecast Event

Panel A - Bad News Firms				
	$AVAR\text{-}(t) = \gamma_0 + \gamma_1 AVARM + \epsilon$			
	Coefficient Estimates and t Statistics			
Dependent Variable	γ_0	γ_1	R^2	F-Ratio
AVAR-10	-.001 (-1.18)	-.150 (-2.48)**	.057	6.167**
AVAR-30	-.001 (-1.74)	-.082 (-2.59)*	.062	6.684**
AVAR-60	-.000 (-1.29)	-.076 (-3.40)*	.122	11.532*

Panel B - Good News Firms				
	$AVAR\text{-}(t) = \gamma_0 + \gamma_1 AVARM + \epsilon$			
	Coefficient Estimates and t Statistics			
Dependent Variable	γ_0	γ_1	R^2	F-Ratio
AVAR-10	-.002 (-1.99)**	.017 (0.187)	-.011	0.035
AVAR-30	-.001 (-1.72)	.015 (0.284)	-.010	0.080
AVAR-60	-.001 (-1.82)	.049 (1.07)	.002	1.151

AVAR - (t) is the average daily abnormal return for the t day period subsequent to the management forecast

AVARM is the average daily abnormal return for the 4 day period surrounding the management forecast

* and ** denote statistical significance at the .01 and .05 levels, respectively, for a two-tailed test

Table 3

Regression Results - Annual Earnings Forecasts

Abnormal Returns at the Subsequent Earnings Announcement Regressed on the Abnormal Returns for the Management Forecast Event

Panel A - Bad News Firms				
	$CARE = \gamma_0 + \gamma_1 CARM + e$			
	Coefficient Estimates and t Statistics			
Dependent Variable	γ_0	γ_1	R^2	F-Ratio
CARE	-.000 (-0.03)	.026 (0.23)	-.011	0.054
Panel B - Good News Firms				
	$CARE = \gamma_0 + \gamma_1 CARM + e$			
	Coefficient Estimates and t Statistics			
Dependent Variable	γ_0	γ_1	R^2	F-Ratio
CARE	-.005 (-0.61)	.254 (1.12)	.003	1.258

CARE is the cumulative daily abnormal return for the 4 day period around the subsequent earnings announcement

CARM is the cumulative daily abnormal return for the 4 day period surrounding the management forecast

Table 4

Stock Performance Subsequent to the Management Forecast -
Annual Earnings Forecasts

Portfolio	Number of Firms in the Portfolio	Average Daily Return	t-statistic
All Firms	180	-.00015	-0.80
Bad News Firms	87	.00025	0.98
Extreme Bad News Firms (CARM < .05)	24	.00121	2.14
Good News Firms	93	-.00052	-1.93
Extreme Good News Firms (CARM > .05)	17	.00021	0.40

Table 5

Descriptive Statistics - Bad News Quarterly Earnings Forecasts

Sample size = 78			
Variable	Mean	Standard Deviation	
CARM (Cumulative Abnormal Return - Management Forecast)	-.05277	.05251	
AVFE (Average Daily Abnormal Return for the Period Between the Forecast and the Subsequent Earnings Announcement)	-.00351	.01100	
FE (Forecast Error Defined as the Difference Between the Actual EPS and the Forecasted EPS Deflated by Pre-Forecast Stock Price)	-.00166	.01135	
CARE (Cumulative Abnormal Return - Earnings Announcement	.01083	.04734	

Pearson Product Moment Correlations (Significance Level)					
	CARM	AVFE	FE	CARE	
CARM	1.00	.12 (.33)	.19 (.09)	-.27 (.02)	
AVFE		1.00	-.03 (.79)	-.09 (.46)	
FE			1.00	.23 (.05)	
CARE				1.00	

Table 6

Regression Results - Bad News Quarterly Earnings Forecasts

Abnormal Return for the Period Between the Forecast and the Subsequent Earnings Announcement Regressed on the Abnormal Return for the Management Forecast Event

$AVFE = \gamma_0 + \gamma_1 AVARM + e$			
Coefficient Estimates and t Statistics			
γ_0	γ_1	R^2	F-Ratio
-.002 (-1.22)	.095 (0.99)	-.000	0.978

AVFE is the average daily abnormal return during the period between the management forecast and the subsequent earnings announcement

AVARM is the average daily abnormal return for the 4 day period surrounding the management forecast

Table 7

Regression Results - Bad News Quarterly Earnings Forecasts

Abnormal Return for the Subsequent Earnings Announcement Regressed on the Abnormal Return for the Management Forecast Event

$CARE = \gamma_0 + \gamma_1 CARM + e$			
Coefficient Estimates and t Statistics			
γ_0	γ_1	R^2	F-Ratio
-.002 (-0.25)	-.240 (-2.41)**	.059	5.812**

CARE is the cumulative daily abnormal return for the four day period around the subsequent earnings announcement

CARM is the cumulative daily abnormal return for the 4 day period surrounding the management forecast

** denotes statistical significance at the .05 level for a two-tailed test

Table 8

Regression Results - Bad News Quarterly Earnings Forecasts

Abnormal Return for the Subsequent Earnings Announcement Regressed on the Abnormal Return for the Management Forecast Event and Forecast Errors

$CARE = \gamma_0 + \gamma_1 CARM + \gamma_2 FE + e$				
Coefficient Estimates and t Statistics				
γ_0	γ_1	γ_2	R^2	F-Ratio
-.003 (-0.35)	-.291 (-2.98)*	1.216 (2.69)*	.130	6.767*

CARE is the cumulative daily abnormal return for the 4 day period surrounding the subsequent earnings announcement

CARM is the cumulative daily abnormal return for the 4 day period surrounding the management forecast

FE is the surprise in the subsequent earnings announcement measured by the difference between the actual quarterly EPS and the forecasted EPS deflated by the pre-forecast stock price

* denotes statistical significance at the .01 level for a two-tailed test

Table 9

Stock Performance Subsequent to the Management Forecast - Bad News Quarterly Earnings Forecasts

Portfolio	Number of Firms in the Portfolio	Average Daily Return	t-statistic
Bad News Firms	78	-.00085	-1.51
Extreme Bad News Firms (CARM < .05)	30	.00055	0.72